

having a first region at a relatively high heat and an adjacent region at a relatively lower heat, the apparatus comprising:

an end-of-arm tool having at least one holder, the end-of-arm tool operational, in use, between a first position between the mold halves where it receives the molded article into a respective one of the at least one holder and a second position outside of the mold, the molded article located, in use, into the respective one of the at least one holder at a time when the molded article retains an amount of heat;

a cooling pin on a frame located adjacent the second position, the cooling pin having a tip and the frame arranged, in use, to move relative to the end-of-arm tool to cause insertion of the tip of the cooling pin into the molded article after the end-of-arm tool reaches the second position;

the cooling pin having an internal channel terminating at the tip that, upon insertion into the molded article by relative movement of the frame and the end-of-arm tool, is within the molded article but spaced away from the first region and wherein the cooling pin, in use, is connectable to a cooling fluid delivery system arranged to force gaseous cooling fluid along the internal channel to cause expulsion of the gaseous cooling fluid from the tip mostly in a direction of the first region to accentuate cooling within at least the first region;

the frame is positioned, during the expulsion of the gaseous cooling fluid from the tip, with respect to the end-of-arm tool such as to define, in use, an open system having a passageway allowing venting of gaseous cooling fluid from an interior of the molded article to an ambient environment; and wherein

the apparatus is operational, during the expulsion of gaseous cooling fluid from the tip, to distance the frame from the end-of-arm tool and the passageway of the open system is produced by formation of a space between a region of an external surface of the cooling pin and an open end of the molded article both located, in use, within the respective holder and positioned adjacent said region of the external surface of the cooling pin.

168. Apparatus according to Claim 167, wherein the apparatus is arranged to introduce the tip of the cooling pin into the preform to a depth that allows the coolant to reach and cool an internal dome portion of a preform.

169. Apparatus according to Claim 167, wherein the frame positions the cooling pin within the molded article such that at least one of:

i) the tip is displaced a first distance from the first region of the molded article;

ii) a sidewall of said cooling pin is located a second distance from internal sidewalls of the molded article; and

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a ratio of the first distance to the second distance is in the range of about 1:1 to about 10:1.

170. Apparatus according to Claim 167, wherein the gaseous cooling fluid comprises cooled pressurized air that is blown along the internal channel.

171. Apparatus according to Claim 167, further including a valve for supplying regulated amounts of gaseous cooling fluid to the cooling pin.

172. Apparatus according to Claim 167, wherein the tip has one of a divergent nozzle construction and a straight-walled nozzle construction, and wherein the internal channel and tip, when located within the molded article, focus the gaseous cooling fluid towards a region principally surrounding the first region.

173. Apparatus according to Claim 167, wherein the cooling pin has one of:

- i) a varying diameter along its length;
- ii) lateral fluid outlets in the sides of the cooling pin, the lateral outlets coupled to the internal channel and arranged to direct cooling fluid to at least one of a neck portion and a body portion of the molded article;
- iii) grooves along an exterior surface of the cooling pin;
- iv) ribs spaced about the periphery of the cooling pin, the ribs protruding from the cooling pin to reduce, in use, over a length of each rib a dimensional separation of an exterior surface of the cooling pin to the internal wall of the molded article;
- v) radial conduits in the sides of the cooling pin, the radial conduits coupled to the internal channel and arranged to direct cooling fluid to at least one of a neck portion and a body portion of the molded article; and
- vi) a plurality of contact elements along an exterior surface of the cooling pin.

174. Apparatus according to Claim 167, wherein:

the end-of-arm tool supports a plurality of holders;